

R228/204

DUBLIN INSTITUTE OF TECHNOLOGY
KEVIN STREET, DUBLIN 8

BSC IN COMPUTER SCIENCE

YEAR 2

SUPPLEMENTAL EXAMINATION 2004

WEB DEVELOPMENT

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3 HOURS (DATE/TIME TO BE PROVIDED)

ATTEMPT **QUESTION 1** AND ANY **THREE** OTHER QUESTIONS

ALL QUESTIONS CARRY EQUAL MARKS.

Section A

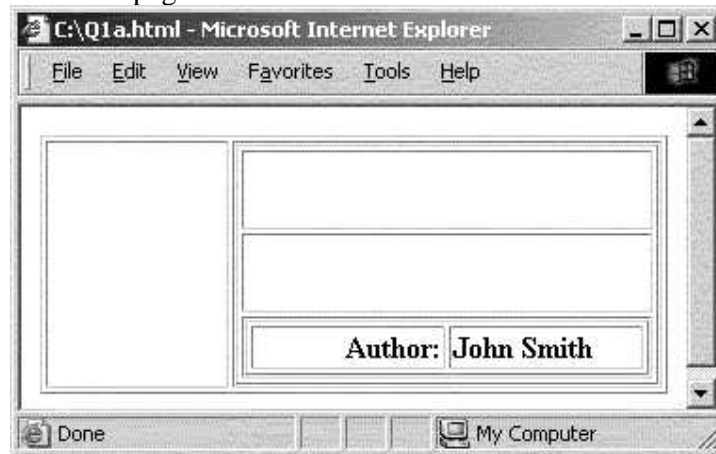
Compulsory

1. Attempt any 5 of parts (a), (b), (c), (d), (e) and (f).

(a) (i) Explain why it is a good idea to use tables when creating a template page for a web site.

(2 marks)

(ii) Provide the HTML code necessary to create the page shown below.



(3 marks)

(b) (i) Frames are no longer commonly used on large websites such as java.sun.com and google.com. Briefly state your opinion on why this is the case.

(2 marks)

(ii) Provide the HTML code necessary to create the frameset shown below.



(3 marks)

- (c) (i) Explain why a web designer would use a Cascading Style Sheet (CSS) in developing a web site. **(2 marks)**
- (ii) Using an example, show how CSS classes and pseudo-classes can be used in web pages. **(3 marks)**
- (d) (i) Why is JavaScript referred to as an *untyped language*? How does this aspect of the language differentiate it from standard high level languages such as C++ and Java? **(2 marks)**
- (ii) Write a simple HTML page containing JavaScript code that will allow a user continually enter numbers in dialog boxes, until -1 is entered. The sum of all the numbers should then be displayed in an alert box. **(3 marks)**
- (e) (i) “JavaScript is a partially object oriented language.”
Provide a brief discussion of why this statement is true. **(2 marks)**
- (ii) Show how it is possible with JavaScript to find out information about the browser that is being used to display the web page. Why is this useful for the web page designer? **(3 marks)**
- (f) (i) What is meant by the *Document Object Model* (DOM), in terms of HTML or XML documents? **(2 marks)**
- (ii) Provide a function that uses the DOM API to add a table to a HTML page that has an empty body. The table should have one row containing two cells. **(3 marks)**

Section B

Attempt any THREE Questions

2. (a) List and discuss the seven stages of the Lazar Web Development Lifecycle. For each stage you should state
- i. The techniques that could be employed, and the situation in which they should be employed.
 - ii. The deliverables at the end of the stage.
- (12 marks)**

- (b) It has long been stated that the user should be core to the web development process. As the World-Wide-Web expands, and becomes core to the provision of financial, informational and governmental services, it is crucially important that the web is accessible to all.

Discuss this point, with reference to the efforts being employed by the World-Wide-Web Consortium to ensure web accessibility.

(7 marks)

- (c) Nielsen lists ten common mistakes in web design.
- i. List five of these mistakes and state your opinion on whether they really are undesirable in all websites.
 - ii. Give two more features of web pages you find undesirable that are not on Nielsen's list.

or

Give two features of web pages that you find highly desirable.

(6 marks)

3. (a) The media often refer to the *Internet* and the *World-Wide-Web* as if they are the same thing. Explain precisely why they are incorrect in so doing.
- (3 marks)**

- (b) Computer networks and networked applications work best when they use protocols regulated by independent organisations such as the Internet Engineering Task Force (IETF) and the World-Wide-Web Consortium (W3C).

Explain clearly what is meant by the term *protocol* in relation to computer networks and why it is highly desirable that the protocols of the Internet and the World-Wide-Web are independently regulated.

(6 marks)

- (c) HTTP, TCP and IP reside on different layers of the so-called TCP/IP protocol stack.

Explain why protocols are stacked and using an example, show how application data is passed between networked applications using protocols at different layers of the protocol stack.

(10 marks)

- (d) Most Internet hosts have a unique name, comprised of their host name and their domain name e.g. www.google.com, even though data is routed through the Internet using addresses rather than names.

Show how names can be converted into addresses, in order to allow data to be correctly routed to named hosts.

(6 marks)

4. (a) Rather than being a language in itself, XML is a language for creating languages, where a DTD or XML Schema defines the vocabulary and syntax of the language.

Discuss this statement with reference to *well-formedness* and *validity*. Use examples and sample code where necessary.

(6 marks)

- (b) Create an XML language that can be used to represent books in a library, where a book has a title, ISBN number and has at least one author, but may have many. An author has a first name, a last name and a country of residence.

You will need to provide the code for the DTD as well as a sample document that belongs to the language.

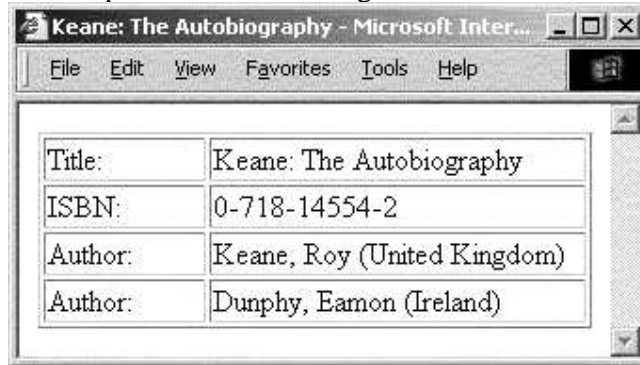
(8 marks)

- (c) Describe the additional information you would have been able to specify had you used an XML Schema in part (b), rather than a DTD.

(4 marks)

Continued overleaf.

- (d) Create an XSL Stylesheet that could be used to convert the document you produced in part (b) into the HTML that produced the output shown in the image below.



The image shows a screenshot of a Microsoft Internet Explorer browser window. The title bar reads "Keane: The Autobiography - Microsoft Inter...". The menu bar includes "File", "Edit", "View", "Favorites", "Tools", and "Help". The main content area displays a table with the following data:

Title:	Keane: The Autobiography
ISBN:	0-718-14554-2
Author:	Keane, Roy (United Kingdom)
Author:	Dunphy, Eamon (Ireland)

(7 marks)

5. (a) HTTP, the protocol of the World-Wide-Web, operates in a *client server* fashion. Java applets, application code delivered over the World-Wide-Web is considered *mobile code*.

Distinguish clearly between the client server model and the mobile code model of distributed computing.

(7 marks)

- (b) HTTP uses URLs to identify resources on the World-Wide-Web. Once a URL is specified, a HTTP request is issued and a response is received.
- Define the term URL, clearly identifying each of its components.
 - Show, using examples, the structure of a HTTP request, including request types and headers.
 - Show, using examples, the structure of a HTTP response, including error codes and headers.

(7 marks)

- (c) HTTP supports the use of cookies to maintain state on a server side application.

Explain what is meant by the term *cookie* and show how JavaScript can be used to manipulate cookies on the client side.

(6 marks)

- (d) Show the HTML code necessary to include a Java applet contained in a ZIP file in a HTML page. Clearly explain each of the tags and attributes you use.

(3 marks)

- (e) Show how it is possible to pass parameters to an applet through the source code of a web page.

(2 marks)

6. (a) Provide the HTML code necessary to produce the form shown in the image below. Note: the form will be submitted using HTTP GET to <http://www.olympics.com/reg>, and a user can choose multiple events.

The image shows a screenshot of a Microsoft Internet Explorer browser window titled "Exam Question 6a - Microsoft Internet Explorer". The browser's menu bar includes "File", "Edit", "View", "Favorites", "Tools", and "Help". The main content area displays a web page titled "Olympic Registration". The form consists of the following elements:

- Name:** A single-line text input field.
- Events:** A list box containing the following options: Swimming, Athletics, Boxing, Tennis, and Vollyball.
- Gender:** Two radio buttons labeled "Male" and "Female".
- Address:** A multi-line text area.
- Buttons:** Two buttons labeled "Send" and "Clear" are positioned at the bottom of the form.

(8 marks)

Continued overleaf.

- (b) If the fields in the form from part (a) were filled in as shown below, to what URL would the form be submitted?

The screenshot shows a Microsoft Internet Explorer window titled "Exam Question 6a - Microsoft Internet Explorer". The browser's menu bar includes File, Edit, View, Favorites, Tools, and Help. The main content area displays a form titled "Olympic Registration". The form consists of four rows of input fields:

- Name:** A text input field containing "Sonia O'Sullivan".
- Events:** A dropdown menu with a list of options: Swimming, Athletics, Boxing, Tennis, and Vollyball. "Swimming" is selected.
- Gender:** Radio buttons for "Male" and "Female". The "Female" radio button is selected.
- Address:** A text area containing "Cobh, Co. Cork, Ireland".

At the bottom of the form, there are two buttons: "Send" and "Clear".

(4 marks)

- (c) Write a JavaScript function that will check that all fields in the form from part (a) have been correctly filled in before the form is submitted. Show the changes to the form that are necessary to ensure that the form will not be submitted if the function determines that the form has not been correctly completed.

(5 marks)

- (d) The send and Clear buttons in the form from part (a) are replaced with the single image shown below. What changes to your code are necessary to ensure that when the left half of the image is clicked, the form will submit, and when the right half is clicked the form will reset.

Note: The image is 350 pixels in width, and 50 pixels in height



(8 marks)